

earth and finely chopped straw; in moulds about 8 inches by 6 by 2½; those of the furnace-baked sort, of two parts earth and one of cinders, well incorporated, and cast in moulds somewhat larger than the above, to provide for about seventy hours' baking.

The Greek bricks, as described by Vitruvius, were of three sorts, called *Pentadoron*, *Tetradoron*, and *Didoron*; the two first were square, and as their names imply, measured, the former five, and the latter four palms on the side; the *Didoron* were oblong, being two palms in breadth, and four in length, that is, a foot by a half a foot; to each of these they made half bricks, which gave them the choice of a greater variety of thicknesses for their walls than they should otherwise have had; the same writer states that the Greeks used the *Pentadoron* for public and the *Tetradoron* for private works; but on the use to which they applied the *Didoron* he is silent, as he also is respecting the thicknesses of their bricks; and it therefore seems reasonable to imagine that as the *Didoron* corresponds with the half *Tetradoron* in length and width, it must have been different in its depth: the bricks made by the ancients generally, were very thin.

The Romans had several sizes of bricks:—Vitruvius mentions, that they had the *Didoron* of the Greeks, and Pliny says, that those chiefly used were a foot and a half long, and a foot broad; while, according to Alberti's observations, they have in some of their buildings, particularly in arch-work, bricks two feet square; besides which he mentions a kind used in pavements and borders that are about 6 inches by 3, and an inch thick, being similar to the Dutch clinkers. *Tavella* are also mentioned by writers and described as being 7×3½; they had also had a sort called *Bipeda*, which were two Roman feet in length; and Quatremere de Quincy describes three sizes that he found among their ancient buildings; the largest 22 inches square by 21 or 22 lines thick; the next 16½ inches square and from 18 to 20 lines thick; and the smallest 7½ inches square by 1½ inch thick. In addition to the quadrangular bricks here enumerated, Alberti directs attention to a right-angled triangular kind, still to be seen in the walls of Rome, more especially in the Aurelian portion, and four of which, he informs us, were made from one brick a foot square, and an inch and a half thick (corresponding in breadth to the *Tetradoron* of the Greeks), by cutting it twice across diagonally before burning; and that the practice being to lay them with the right-angle inwards, the work seemed, externally, to consist of the square bricks from which they were formed; and De Quincy says, that the small bricks above mentioned were halved diagonally, and used in the facing of rubble walls, the work being bonded by courses of the large square bricks at every four feet in height. These three-cornered bricks suggest the idea of building walls with a system of triangular facings and quadrangular fillings (if such is not what Alberti describes), in which the bond would be secured in the usual way by breaking the vertical joints in the face; in Palladio's time, bricks were termed *Quadrelle*, and with regard to their sizes, he says they may be larger or smaller according to the nature of the purpose for which they are intended.

In a description in the *Archæologia*, of one of the most extensive Roman villas discovered in Great Britain, there are, a hearth formed of bricks about 7 inches square; a mosaic pavement, bordered by three rows of black and red tiles, 6 inches square, laid chequer-wise, bounded next the wall by a row of bricks 15½ by 11 inches; and piers of the *præfurnium*, 2 feet 9 high and 7½ inches square, consisting of eighteen layers of bricks, with a larger one 10½ square at top and bottom.

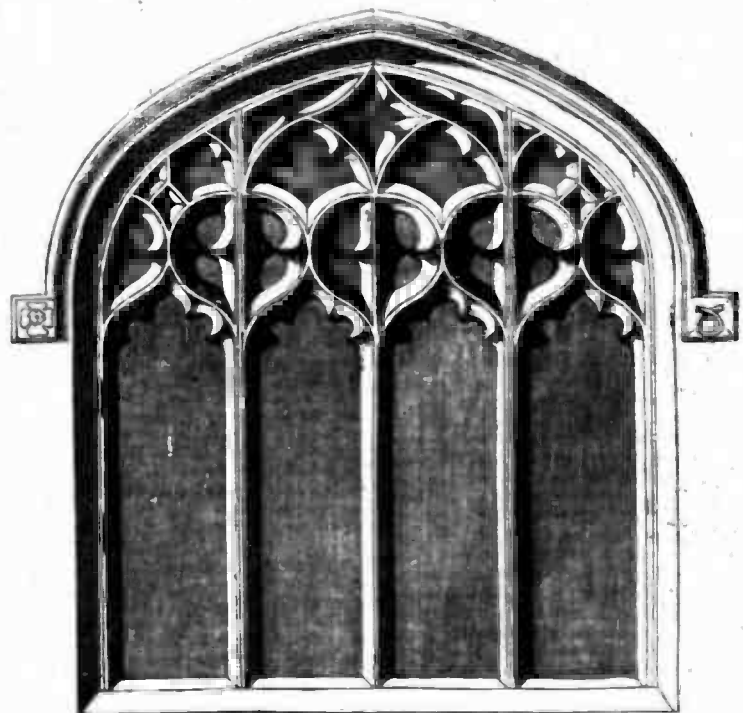
Vitruvius has handed down to us his professional impressions on the subject of brick-making, and which will be found not to differ materially from the principles and practice of our own period. Treating of *unburnt bricks*, he says, that sandy, stony, or gravelly loam, should not be employed; because the straw that is put in the bricks would not combine well; they would be heavy, also very liable to swell, and disunite and dissolve on being much wetted; they ought to be made either of a red, a chalky white, or a coarse-grit, sandy earth, as these are pliable and unite well, and being light, are handled with facility in building.

They should not be made in summer, because when dried in the intense heat of that season, they are parched outside, and, apparently, thoroughly dried, while the heart is but imperfectly so; and if used in that condition, their subsequent shrinkage causes unsightly fractures in the incrustation or plastering, as well as serious defects in the walls themselves; they ought, therefore, to be made either in the spring or autumn, when they dry more equally; but, he adds, to insure their being sufficiently seasoned, it is best not to use them before they have been made two years; and, indeed, at Utica, the law permits none to be used within five. This writer informs us that at Pitome in Asia, Calentum in the farther Spain, and also at Marseilles in Gaul, there were bricks made of a pumiceous earth, which would swim if thrown into water, being light and porous in their texture, replete with air, and impervious to wet. Alberti states that the ancients mixed marble with the red earth of which they made their bricks; and it appears that in order they might be burnt the better, they made holes in the larger sorts when moulding them.

On turning our attention to the introduction and progress of the art in this country, we find, as already stated, that the earliest examples are in the ancient Roman walls, in which it appears in the form of arches and bonding to rag and rubble stone-work, courses being laid through, averaging four or five in number, at intervals of about three or four feet in height. The size of these bricks is mentioned by Stowe as being 17½ by 11½ inches, and 1½ in. thick. The Saxons and Normans both practised it (under the name of *Tigel*, whence our word *Tile*), and although it seems that they availed themselves largely of the Roman bricks, yet it also appears that they manufactured them, and in their later remains, even of varied and moulded forms, as in the abbey church at St. Alban's and the Priory of St. Botolph, at Colchester. But it was not until early in the fourteenth century that they were made in England similar to the present or Flemish mode, that is, oblong in form, and thick in proportion compared to the tile-like brick of the ancients; and at that period they were of different sizes, some being 12 by 6 by 3, others 10 by 5 by 2. The name of bricks belongs to the early part of the fifteenth century, at which time their price was about 6s. per thousand; up to this time they were only used after a fashion similar to that of the Romans, combined with flint and rag stone-work, in bonding tiers, piers at intervals in the solid walls, with lozenge interlacings of dark headers

among the black even-dressed flint-work between, such being the general appearance of the castellated buildings of that period; and it was not until three-fourths of the century had gone by that the first houses entirely constructed of brick were erected. In the Tudor times very fanciful yet pleasing forms of moulded-work were introduced pertaining to the style of architecture that arose and reigned during that period; and which, after declining for some time and being superseded by the Romano-Italian style of Inigo Jones, in the outset of the Stuart dynasty, gave way to the forms and details of a more severe and classic school. It is said to have been Sir Richard Cripe, the friend of Charles the Fifth, who conceived the mode of making bricks according to the present practice, and we may date the perfection of the system of combination called English bond to that period. In 1605, a law was passed enjoining that all buildings should thenceforth be of stone or brick, and which was enforced with a fluctuating rigour up to that memorable era in the history of London, when an insatiable element convinced its citizens of the unquestionable expediency of such an enactment. Then the "wooden walls" disappeared, and the geological position of the Great Metropolis denying it the advantages of stone, the use of brick from that time universally obtained.

About the reign of William and Mary, was imported to this country, along with other Dutch fashions, the mode of building distinguished by the name of Flemish Bond, and which soon, and indeed almost ever since, bore the bell, by reason of its plausible exterior. We are now, however, more sensible of its counterbalancing inferiority as a bond, and what with the spreading use of compo, and the fact that the difference between it and the English bond is only discernible at a small distance from the work, together with a germinating disposition to return to the fashions of our forefathers, it is likely to drop into desuetude. Unfortunately, at the same time, it is to be feared, that the practice of stuccoing above alluded to, while it is attended with manifest advantages, in reference to the facilities it offers for architectural design, and its beneficial agency in preserving the walls from the vicissitudes of the weather, will favour a tendency to carelessness on the part of bricklayers, both in regard to materials and workmanship, which the vigilance of the superintendent may not always detect; indeed it is scarcely extravagant to suppose that were the practice to become universal, a regular principle of bond would soon cease to exist.



WINDOW IN SOUTH AISLE, THORNBURY CHURCH, GLOUCESTERSHIRE.